Introduction

In Western and Eastern Africa, Anogeissus leiocarpa population dynamic at forest borders in northern Guinea and Sudanian zones was slightly documented (Poilecot et al., 1991). Certainly, protected areas are important for the biodiversity conservation (IUCN, 1994). Since the species is more used for firewood in the Pendjari Biosphere Reserve (PBR) peripheral, do the status of the A. leiocarpa population change from the reserve to the land use area? The present study aims to assess and compare dendrometrical characteristics of the species between protected and land use areas.

Methods

- Prospecting plant formation in the land use area and use of the PBR vegetation map.
- Establishment of 15 and 10 plots (30 m x 30 m) in: (i) Mosaic Forest; (ii) Savannah stands of the PBR; (iii) and Riparian Forest surrounding land use area.
- Dendrometrical data collection on A. leiocarpa such as: (i) Diameter (d) of individuals that dbh ≥10 cm; (ii) Basal Area (G); (iii) Height (H); (iv) Size class distribution of diameter and height; (v) and Densities by size class.
- Comparative analyses of the PBR and land use area by diameter, basal area, height and density using both parametric and non-parametric tests (t Student and test of Mar-Whitney) respectively.
- Analysis of the Size class distributions of diameter and height with: (i) the median dbh (Jayaraman, 1999); (ii) and the coefficient of Skewness (Feely et al., 2007).
- Statistical analyses were performed using Minitab 13.2 software.

Results

1. Comparative Diameters class distribution (Park versus land use area)

![Figure 2: Diameter class distribution adjusted at normal curve in Park](image)

![Figure 3: Diameter class distribution adjusted at normal curve in land use](image)

2. Comparative size distributions: Median dbh and coefficients of Skewness of diameter

**Table 1:** Median dbh and coefficients of Skewness of diameter class distribution of Anogeissus leiocarpa in the Pendjari Biosphere Reserve and its land use area.

<table>
<thead>
<tr>
<th>Area</th>
<th>Median dbh (cm)</th>
<th>61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve</td>
<td>11.70</td>
<td>0.73</td>
</tr>
<tr>
<td>Land use area</td>
<td>14.09</td>
<td>0.48</td>
</tr>
</tbody>
</table>

3. Comparative other dendrometrical parameters (Reserve versus land use areas)

**Table 2:** Anogeissus leiocarpa dendrometrical parameters (Mean ± standard error); ***: p<0.001; *: p<0.05; NS: non significant.

<table>
<thead>
<tr>
<th>Area</th>
<th>D (cm)</th>
<th>G (m²/ha)</th>
<th>H (m)</th>
<th>D1 (stem/ha)</th>
<th>D2 (stem/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve</td>
<td>17.82 ± 3.06</td>
<td>9.71 ± 5.64</td>
<td>9.46 ± 3.21</td>
<td>230 ± 418</td>
<td>274 ± 74</td>
</tr>
<tr>
<td>Land use area</td>
<td>22.39 ± 5.55</td>
<td>9.49 ± 4.18</td>
<td>10.03 ± 3.22</td>
<td>104.76 ± 78.79</td>
<td>176 ± 53.45</td>
</tr>
</tbody>
</table>

Significance **NS NS**

Discussion

- The size class distribution of diameter showed important number of individuals in the small class diameter (Fig. 1 & 2) of both the PBR and land use areas. However, bigger diameter classes from 30 cm to 60 cm have expressed an important number in the peripheral (Riparian forest habitat) than in the Reserve (Mosaic savannah – forest). This result corroborates findings of Hennenberg et al., (2005) in which A. leiocarpa occurred in savannahs (with more small size class) and in forests (with individuals of bigger size class).
- The use of A. leiocarpa as firewood is reducing Riparian forest sizes, which are mostly represent a sacrifice site for certain human populations. While Riparian forest habitats are conserved, individuals of woodlands are more cut for the fire in land use area.
- The height class (8–12 m) showed the high density of individuals in both areas (Fig. 3). But the bigger density in the land use areas compared to the Park is consistent with the presence of big individuals in those areas.
- The median dbh is bigger in land use area than in the Reserve (Table 1), indicating important bigger diameter individuals of land use areas compared to the Reserve. A. leiocarpa population is younger in Reserve than in land use area. The positives values of Skewness’ coefficient in both areas indicate a positive asymmetry of the diameter class distributions.

Conclusion

- Anogeissus leiocarpa would be threatened in the peripheral while the population is apparently healthy in the Reserve.
- But the traditional practices appeared to be favourable for the presence of bigger diameter individuals in riparian forests.
- These individuals can assume the seed production and the regeneration of young stand.

References


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